



OREGON OFFICE OF STATE FIRE MARSHAL

Serving Oregon to protect life, property and the environment from fire and hazardous materials.

BASIC FIRE INVESTIGATION 100



STUDENT HANDOUTS

*Office of State Fire Marshal
4760 Portland Road NE
Salem, Oregon 97305*

Revised March 23, 2010



**OREGON REVISED STATUTES, OREGON ADMINISTRATIVE RULES,
AND ATTORNEY GENERAL OPINIONS
BASIC FIRE INVESTIGATION 100**

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OREGON REVISED STATUTE CHAPTER 476:STATE FIRE MARSHAL; PROTECTION FROM FIRE GENERALLY CURRENT EDITION

476.030 Powers and duties of marshal and deputies generally; exemption of certain governmental subdivisions; inspection of adult foster homes.

- (1) The State Fire Marshal shall enforce all statutes, and make rules relating to:
 - (a) The prevention of fires.
 - (b) The storage and use of combustibles and explosives.
 - (c) The maintenance and regulation of structural fire safety features in occupied structures and overseeing the safety of and directing the means and adequacy of exit in case of fire from factories, asylums, hospitals, churches, schools, halls, theaters, amphitheatres, all buildings, except private residences, which are occupied for sleeping purposes, and all other places where large numbers of persons work, live or congregate from time to time for any purpose except that structural changes shall not be required in buildings built, occupied and maintained in conformity with state building code regulations applicable at the time of construction.
 - (d) Standards for equipment used for fire protection purposes within this state including standard thread for fire hose couplings and hydrant fittings.
- (2) The State Fire Marshal and deputies shall have such powers and perform such other duties as are prescribed by law.
- (3) If, in the opinion of the State Fire Marshal, a governmental subdivision of the state has enacted adequate regulations generally conforming to state and national standards concerning fire prevention, fire safety measures and building construction requirements for safety, and if the governmental subdivision provides reasonable enforcement of its regulations, the State Fire Marshal may exempt the area subject to such regulation either partially or fully from the statutes, rules and regulations administered by the State Fire Marshal. Prior to adoption of any such exemption, the State Fire Marshal may request from the Department of Public Safety Standards and Training consideration of and recommendations regarding the exemption. The exemption may extend for a two-year period, and may be renewed from time to time, but may be canceled by the State Fire Marshal following 30 days' written notice if the State Fire Marshal finds that the governmental subdivision's regulations or enforcement thereof are not reasonably sufficient. The governmental subdivision shall furnish a copy of such regulations to the State Fire Marshal and shall file with the State Fire Marshal any amendment thereto within 30 days before the effective date of such

amendment. The State Fire Marshal shall designate a person or division within such governmental subdivision as an approved authority for exercising functions relating to fire prevention, fire safety measures and building construction. Upon request of a local official having enforcement responsibility and a showing of unusual fire hazard or other special circumstances, the State Fire Marshal shall make investigation and appropriate recommendations.

(4) The State Fire Marshal may investigate or cause an investigation to be made to determine the probable cause, origin and circumstances of any fire and shall classify such findings as the State Fire Marshal may find appropriate to promote fire protection and prevention.

(5) The State Fire Marshal shall provide training in fire safety inspection to the Department of Human Services, area agencies, community mental health and developmental disabilities programs and to designees of the Long Term Care Ombudsman. If an adult foster home has been inspected by the Department of Human Services, an area agency or community mental health and developmental disabilities program and the agency conducting the inspection reasonably believes that the adult foster home is not in compliance with applicable fire safety rules, the agency conducting the inspection may request the State Fire Marshal to inspect or cause an inspection to be made. If a designee of the Long Term Care Ombudsman, in the course of visiting an adult foster home, believes that the adult foster home is not in compliance with applicable fire safety rules, the designee shall report the problem to the appropriate agency to request a fire safety inspection by the office of the State Fire Marshal or by a designated representative of the office of the State Fire Marshal.

(6) Upon the request of the Department of Human Services, an area agency or community mental health and developmental disabilities program, the State Fire Marshal shall inspect or cause an inspection to be made to determine if the adult foster home is in compliance with rules jointly adopted by the Department of Human Services and the State Fire Marshal establishing fire safety standards for adult foster homes.

(7) As used in subsections (5) and (6) of this section:

(a) "Adult foster home" has the meaning given that term in ORS 443.705.

(b) "Area agency" has the meaning given that term in ORS 410.040.

(c) "Community mental health and developmental disabilities program" means a program established under ORS 430.620. [Amended by 1957 c.265 §1; 1963 c.523 §5; 1965 c.602 §1; part renumbered as part of 476.010;

1967 c.417 §1; 1973 c.667 §16; 1977 c.821 §3; 1985 c.118 §2; 1985 c.726 §18; 1989 c.696 §1; 1993 c.185 §25; 1997 c.13 §1; 1997 c.853 §40; 2001 c.900 §206]

476.060 Local officers and constables as assistants to State Fire Marshal.

(1) All fire marshals in those governmental subdivisions having such officers, and where no such officer exists, the chief of the fire department of every city or rural fire protection district in which a fire department is established, the marshal or chief of police, officer of any city in which no fire department exists, and constables, if any, shall be, by virtue of the offices held by them, assistants to the State Fire Marshal without additional recompense, subject to the duties and obligations imposed by law, and shall be subject to the direction of the State Fire Marshal in the execution of the provisions of this section and ORS 476.070, 476.090, 476.150, 476.210 and 480.445.

(2) In addition to other duties under subsection (1) of this section, an individual designated as an assistant to the State Fire Marshal shall aid in the administration and enforcement of ORS 480.200 to 480.290 and 480.990 (6) upon the request of the State Fire Marshal. [Amended by 1965 c.602 §3; 1971 c.518 §22; 1983 c.740 §188; 1987 c.158 §103; 2005 c.88 §4]

476.070 Entering buildings and premises.

The State Fire Marshal, the deputies or assistants of the State Fire Marshal, or any of them, may:

(1) At all reasonable hours, in performance of the duties imposed by the provisions of ORS 476.030, enter upon and examine any building or premises wherein fire has occurred, and other buildings or premises adjoining or near the same.

(2) For just cause and for the purpose of examination, enter, at all reasonable hours, in and upon all buildings and premises within their jurisdiction.

476.150 Entry and inspection of premises; interfering with or preventing entry prohibited.

(1) The State Fire Marshal and deputies, at all reasonable hours, may enter into all buildings and upon all premises, except private residences, for the purpose of inspection to ascertain if fire hazards exist therein or thereon. Owners of private residences may request a fire inspection of their property.

(2) No person shall interfere with or prevent any such inspection by such officers.

(3) When any person interferes with or prevents the State Fire Marshal or deputies from making the inspection mentioned herein, the officer shall apply to the district attorney of the county wherein the inspection was made or attempted to be made, for a warrant for the arrest of the offending person, and it shall be the duty of such district attorney forthwith to prosecute such offending person.

[Formerly 476.080]

476.170 Execution of warrant. (1) Except as provided in subsection (2) of this section, in executing an inspection warrant, the person authorized to execute the warrant, before entry, shall make a reasonable effort to present the person's credentials, authority and purpose to an occupant or person in possession of the building or premises and present the warrant or a copy thereof.

(2) An inspection warrant must be executed and returned to the court by whom it was issued within 10 days from its date, unless such court before the expiration of such time, by endorsement thereon, extends the time for five days. After the expiration of the time prescribed by this subsection, the warrant unless executed is void. [1987 c.362 §5]

476.210 Investigation of fires by municipal officers and constables; reports; exemption.

(1) The municipal fire marshals, fire department chiefs, constables and other officers referred to in ORS 476.060 shall investigate the cause, origin and circumstances of each fire occurring in their respective cities, villages or townships, by which property has been destroyed or damaged, and shall make an investigation to determine whether the fire was the result of carelessness or design. The investigation shall be commenced immediately after the occurrence of the fire. The State Fire Marshal may superintend and direct the investigation if the State Fire Marshal deems it necessary.

(2) The fire chief of every city, or rural fire protection district shall provide the State Fire Marshal with a full report of every fire occurring within the jurisdiction of the fire chief on a form provided or approved by the State Fire Marshal. Whenever the fire chief of every city under 200,000 population finds any fire is of undetermined or suspicious origin or involves a death or serious injury, the fire chief shall immediately notify the State Fire Marshal or a deputy state fire marshal and shall assemble all known facts and circumstances concerning the fire in an approved report form and shall submit such report to the State Fire Marshal, or the deputy state fire marshal assigned to the territory in which the fire originated. When evidence clearly indicates the cause of fire to be of incendiary origin, the fire chief shall also immediately notify the state, county or municipal police agency.

(3) This section shall not apply to forestlands under the jurisdiction of the State Forester. [Amended by 1965 c.602 §9; 1967 c.417 §6]

Note: The information listed above, does not contain all of the depth and breadth listed in ORS 476 – State Fire Marshal, Protection from Fire Generally, but what directly pertains to Basic Fire Investigation 100

BASIC FIRE INVESTIGATION 100



TERMS AND DEFINITIONS

Accelerant	A fuel, usually a flammable liquid, used to initiate or increase the fire or increase the intensity, or speed of spread
Accidental fires	“Fires where the proven cause does not involve a deliberate human act to ignite or spread fire into an area where the fire should not be.”
Arson (NFPA 921)	“The crime of maliciously and intentionally, or recklessly starting a fire or causing an explosion.” <ul style="list-style-type: none">• ORS 164.325; Arson in the First Degree• ORS 164.315; Arson in the Second Degree• ORS 164.335; Reckless Burning• ORS 164.345, 164.354, 164.365; Criminal Mischief
Backdraft	Instantaneous combustion that occurs when oxygen is introduced into a smoldering fire. The stalled combustion resumes with explosive force.
Conduction	Heat transfer to another body or within a body by direct contact.
Consent	<ul style="list-style-type: none">• Verbal (OK if “witnessed”) or Written (Best)• Make sure consent is from the correct person• Must be voluntary, informed, conditional, & able to be withdrawn at anytime
Convection	Heat transferred by the movement of air or liquid
Emergency Condition	No permission is required due to the ongoing emergency operation; Overhaul includes fire cause determination. When the scene has been abandoned, the only way to return to the scene is by consent or warrant.
Fire (NFPA 921)	“A rapid oxidation process, which is a chemical reaction resulting in the evolution of light and heat in varying intensities.”



TERMS AND DEFINITIONS

Fire Cause (NFPA 921)	“The circumstances, conditions, or agencies that brought about or resulted in the fire or explosion incident, damage to property resulting from the fire or explosion incident, or bodily injury or loss of life resulting from the fire or explosion incident.”
Fire Development	The development of fire has several processes including units of fire measurement, heat transfer through conduction, convection, and radiation, ignition, sources, factors and processes, fire phases, and fire cause elements.
Fire Effect (NFPA 921)	“The observable or measurable changes in or on a material as a result of exposure to fire.
Fire Investigation	The Process of determining the origin, cause, and development of a fire or explosion.
Fire Pattern Development (“V” Patterns)	<p>This is from NFPA 921 2004 ed. 6.2.2.3 and another dimension to the theory that sharp v patterns indicate a fast burning fire.</p> <p>Lower heat release rate fuels may not produce flame heights sufficient for the flame zone of the plume to reach a ceiling or other horizontal barrier. These fires produce triangular shaped fire patterns with the bases at the bottom and the vertices at the top, such as an inverted cone or hourglass patterns. As the rate of heat release increases and the flame zone begins to approach the horizontal barrier, the sides of the patterns produced become columnar (straight sided). As the heat release rates continue to increase, creating ceiling jets and /or descending upper smoke layers, descending flame impingement on surfaces and downward radiating heat energy begin to broaden the tops of the fire patterns and V or U shaped pointer or arrow patterns are produced on truncating vertical surfaces. Circular shaped patterns are produced on the bottoms of horizontal surfaces</p>
Fire Patterns (NFPA 921)	“The visible or measurable physical changes, or identifiable shapes, formed by a fire effect or group of fire effects.”
Fire Spread (NFPA 921)	“The movement of fire from one place to another”
Flashover	A transition phase in the development of a contained fire in which surfaces exposed to thermal radiation reach ignition temperature more or less simultaneously and fire spreads rapidly throughout the space.



TERMS AND DEFINITIONS

Fuel Load	Amount of fuel in a room or space may have an effect on the fire patterns and how much damage that may occur.
Hostile Fires	OSFM investigates “hostile fires”; Reportable (ORS 476.210) <ul style="list-style-type: none"> • “by which property has been destroyed or damaged” • “of undetermined OR suspicious origin OR involving a death OR serious injury”
Incendiary Fire Cause (NFPA 921)	“A fire that is intentionally ignited under circumstances in which the person knows that the fire should not be ignited.”
Incendiary Fires	A deliberately set fire intended to destroy property.
Inspection Warrants	Authorized by ORS 476.150 to 476.170 to permit investigators to enter property when access is denied.
Lines of Demarcation	<ul style="list-style-type: none"> • The borders produced between the different affected areas. • They provide visual differences in certain heat and smoke effects on various materials.
Natural Fires (NFPA 921)	“Fires where the proven cause does not involve direct human intervention.”
Nature of Calcination	<ul style="list-style-type: none"> • Chemically bound water forced out of the gypsum wallboard by heat • Seen as gray in color, sometimes blue • Calcinated areas display lines of demarcation
Origin (NFPA 921)	<p>Point of - “The exact physical location where a heat source and a fuel come in contact with each other and a fire begins.”</p> <p>Area of - “The room or area where a fire began.”</p>

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TERMS AND DEFINITIONS

ORS 476.210	Oregon law authorizing fire investigations.
Overhaul (IFSTA Essentials)	“Operations for searching and extinguishing hidden or remaining fires, placing buildings and their contents in a safe condition, determining the (origin and) cause of fires, and recognizing and preserving evidence of arson.”
Radiation	Heat transfer by way of electromagnetic energy.
Roll Over	The condition where unburned fuel from the originating fire has accumulated in the ceiling layer to a sufficient concentration that it ignites and burns. This can occur without ignition and prior to the ignition of other fuels separate from the origin.
Undetermined Fire Causes	<p>Undetermined generally means the investigator is either unsure or has not been able to find a cause.</p> <p>Suspicious should be listed as Undetermined</p> <p>Fire cause should be based on evidence rather than absence of evidence. However, when the origin is clearly defined, it is occasionally possible to make a credible hypothesis regarding the cause of a fire, even if there is no physical evidence of that cause.</p> <p>Inferred fire causes are acceptable using process of elimination.</p> <p>Elimination involves the testing and rejection of alternate hypotheses (theories) and may not be possible in many cases due to the degree of destruction in the compartment of origin.</p> <p>This can be accomplished provided that the remaining cause is consistent with all known facts.</p>



FIRE FIGHTER OBSERVATION REPORT

Firefighter Observation Report

Date: _____ Alarm Time: _____ Time Responded: _____ On-Scene Time: _____

Fire Department: _____ Incident Date: _____ Apparatus # _____

Incident Location: _____ Incident # _____

Firefighter Name: _____ Address: _____

Phone #: _____ (home) _____ (cell) _____ (work)

Function (circle)

- Initial Attack Team, Tender Op's.
- Back-up Attack Team, Safety, Accountability
- Engineer, Ventilation, Salvage/Overhaul,
- (Other – Specify) _____

Position (circle)

- C.O., Lieut., Capt., Asst. Chief,
- Chief Eng., Lead FF, Safety Of.,
- Op's Chief – Incident Command
- (Other – Specify) _____

Circle your response for the following:

1. What was the color of smoke upon arrival? (Black-Gray-White-Red-Yellow-Orange-Green)
2. What was the color of the flames upon arrival? (White-Red-Yellow-Orange-Blue)
3. What location (or locations) was the fire venting upon arrival? (Roof-Side A, B, C, D) – (Window (s) – Side A, B, C, D)- (Door (s) Side A, B, C, D)
4. Were door (s) locked or unlocked upon your arrival? (Locked-Unlocked)
5. Did you notice evidence of forcible entry prior to your entry in the building? Yes No
6. Did you notice any windows of doors covered and/or broken out? Yes No N/A
7. Describe the overall fire scene and other observations:

Did you notice any windows of doors covered and/or broken out? Yes No N/A

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FIRE FIGHTER OBSERVATION REPORT

8. From what direction did you attack the fire and what size hose line did you use?

9. What area did you first put water on the fire?

10. What area was extinguished last?

11. Did the fire behave in an abnormal manner Yes No N/A If Yes, explain on pg. 3

12. Did you notice any unusual smells? Yes No N/A If Yes, explain on pg. 3

13. Were there any unusual reactions of the fire to water? Yes No N/A If Yes, explain on pg. 3

14. Did you or anyone you know turn the electrical panel off? Yes No N/A

15. What breakers were tripped prior to turning off the electrical panel? N/A Explain

16. Did you notice any conditions created to assist the fire spread? Yes No N/A If Yes, explain on pg. 3

17. Was there any type of obstacle (s) that may have been used to block firefighters and/or firefighting efforts? Yes No
N/A If Yes, explain on pg. 3

18. Did you move any item from its original location that may be of interest to the investigation of this fire? Yes No N/A
A If Yes, What? _____

19. Did you notice anything unusual in route or leaving the scene? Yes No N/A If Yes, explain on pg. 3



PERMISSION TO ENTER FORM

OREGON STATE FIRE MARSHAL
PERMISSION FOR FIRE INVESTIGATION
ENTRY FORM

I, _____, willingly and of my own free will give
permission to _____ of the _____

to enter the property I own O rent O lease O _____
(Initial)

The property is located at: _____

(Initial)

The reason for entering is to investigate the cause of the fire that took place on the
date of: _____
(Initial)

I am also giving entry permission to the police and others helping in this investigation. _____
(Initial)

I have been told the careful search may take from several days to up to 30 days. _____
(Initial)

I am allowing the investigators to return and re-enter my property during reasonable
hours during the 30 days to continue the search. _____
(Initial)

I give permission for items to be removed from my property to be tested. _____
(Initial)

I understand this search may be used in a court of law. _____
(Initial)

I understand that I do not have to give permission. _____
(Initial)

I understand I may take away this permission at any time. _____
(Initial)

(Signature) (Date)

(Witness) (Witness)